UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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HANNON, CHRISTIAN A

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/569,179	LINNARTZ, JOHAN PAUL MARIE GERARD
	Examiner	Art Unit	
	CHRISTIAN A. HANNON	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____.
2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-16 and 18-22* is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) *1-4,10-16 and 18-22* is/are rejected.
7) ☒ Claim(s) *5-9* is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☐ All   b) ☐ Some *   c) ☐ None of:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____.
      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date *9/21/2007*.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____ .

DETAILED ACTION

This action is response to applicant's response filed on 12/17/2007. Claims 1-

16,18-22 are now pending in the present application. **This action is made final.**

Information Disclosure Statement

1.   The information disclosure statement (IDS) submitted on 9/21/2007 is in

compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure

statement is being considered by the examiner.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) The invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3.   Claims 1-4, 10-16 & 18-21are rejected under 35 U.S.C. 102(e) as being clearly

anticipated by Yoshida et al (US 2003/0053412), hereinafter Yoshida.

Regarding claim 1, Yoshida teaches a diversity receiver comprising a first

receiving branch having associated thereto a first antenna element (receive branch 11-

1, 12-1; Figure 7) and at least a second receiving branch having associated thereto a

second antenna element (receive branch 11-3, 12-3; Figure 7), the diversity receiver

comprising first means for obtaining from a first signal on the first receiving branch and a second signal on the second receiving branch a third signal representing an estimation of the spatial derivative, or average amount of phase shift, of at least one receiving channel parameter (Page 4, [0056]), wherein the third signal is used to cancel or at least reduce signal distortions that occur due to time-variations of the receiving channel (Page 4, [0057]).

Regarding claim 2, Yoshida teaches claim 1, wherein the first antenna element and the second antenna element are closely spaced and arranged behind each other in the direction of motion of the diversity receiver (Figure 7, Page 5, [0060]).

Regarding claim 3, Yoshida teaches claim 1, wherein the first means obtain the third signal as a difference between the first signal and the second signal (Page 4, [0053]; Page 5, [0061]).

Regarding claim 4, Yoshida teaches claim 1, wherein the third signal is interpreted as a temporal derivative of the at least one receiving channel parameter at least when the diversity receiver is moved (Page 4, [0057]). Yoshida teaches that the phase difference is considered constant momentarily at the instant in time the sample is received.

Regarding claim 10, Yoshida teaches claim 1, wherein the at least one receiving channel parameter is a receiving channel transfer function (Page 5, [0061]). Yoshida teaches that the channel parameter is that of a difference between received and transmitted phase, that is a relation between what was input to that of which was output, and thereby reads on the currently recited claim language.

Regarding claim 11, Yoshida teaches claim 1, wherein for creating a virtual third antenna element there are provided switching means for switching from a signal on the first receiving branch to a corresponding signal on the second receiving branch (Page 5, [0060]).

Regarding claim 12, Yoshida teaches claim 1, wherein the first antenna element and the second antenna element are arranged in parallel but extend in different directions (Figure 7, antennas 11-1, 11-3, directivities S-1 & S-3; Page 5, [0060]).

Regarding claim 13, Yoshida teaches claim 1, wherein the diversity receiver is adapted to be used in Orthogonal Frequency Division Multiplexing (OFDM) systems (Page 1, [0001]).

Regarding claim 14, Yoshida teaches the method for canceling or at least reducing signal distortions of a radio signal received by a moving diversity receiver especially a moving diversity receiver according to claim 1, wherein the signal distortions occur due to time-variations of a receiving channel in a radio system, said method comprising the following steps, receiving the radio signal at two closely spaced positions differing in the direction of motion (Figure 7, S1, S3, 11-1,11-3; Page 5, [0060]), estimating the spatial derivative, shift variation per symbol of at least one receiving channel parameter on the basis of the radio signal received at the two positions (Page 5, [0061]), interpreting the spatial derivative of the at least one receiving channel parameter as the temporal derivative, momentary fixed value, of the at least one receiving channel parameter (Page 4, [0057]) and exploit the temporal derivative of

the at least one receiving channel parameter to cancel or at least reduce the signal

distortions (Page 5, [0061]).

Regarding claim 15, Yoshida teaches the method of claim 14, wherein the step of

estimating the spatial derivative comprises calculating a difference between the radio

signal received at a first position of said two closely spaced positions and the radio

signal received at a second position of said two closely spaced positions (Page 4,

[0053-0054]; Page 5, [0061]).

Regarding claim 17, Yoshida teaches an antenna system for receiving a radio

signal at at least two closely spaced positions different in the direction of motion,

wherein the antenna system comprises at least a first antenna element and a second

antenna element arranged such that the mutual interaction of the radio patterns is small

(Figure 7, 11-1 & 11-3; Page 5, [0060]).

Regarding claim 16, Yoshida teaches the computer readable medium encoded

with a computer program following the steps of estimating on the basis of a radio signal

received at two closely spaced positions different in the direction of motion the spatial

derivative of at least one receiving channel parameter (), interpreting the spatial

derivative of the at least one receiving channel parameter as the temporal derivative of

the at least one receiving channel parameter () and exploiting the temporal derivative of

the at least one receiving channel parameter to cancel or at least reduce the signal

distortions (Page 4, [0056-0057]; Page 5, [0060-61]; Page 10, [0116]).

Regarding claim 18, Yoshida teaches a diversity receiver comprising a first

antenna configured to receive a first signal on a receiving channel (Figure 7, Item 11_1),

a second antenna configured to receive a second signal on the receiving channel

(Figure 7, Item 11_2) and a combiner configured to form a third signal from the first signal

and the second signal (Page 4, [0056-0057]) wherein the third signal, the compensation

control 'signal' represents an estimation of a spatial derivative of at least one receiving

channel parameter wherein the third signal is used to reduce signal distortions, ICI, that

occur due to time-variations, fading, of the receiving channel (Page 4, [0053-0054]).

Regarding claim 19, Yoshida teaches claim 18, wherein the combiner is

configured to form the third signal, the compensation control, from the first signal and a

difference signal, delta phi, the difference signal being a difference between the first

signal and the second signal (Page 4, [0053-0054]).

Regarding claim 20, Yoshida teaches claim 19, further comprising a weighting

unit configured to multiply the difference signal with a factor that depends on at least

one a speed of the diversity receiver and a distance between the first antenna and the

second antenna (Page 5, [0067]; Page 6, [0072]).

Regarding claim 21, Yoshida teaches claim 19, further comprising a decorrelator

configured to decorrelator the difference signal and the third signal and compute a

weighting factor for weighting the difference signal (Page 5, [0067]).

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains.
Patentability shall not be negatived by the manner in which the invention was made.

5.   Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida.

Regarding claim 22, Yoshida teaches claim 19, further comprising a multiplier configured to multiply the difference signal by a function (Page 5, [0067]). However Yoshida fails to teach that function is a linear ramp function. Yoshida teaches that a coefficient alpha ranges from 0 to 1, thereby all values ranging from 0 to 1, the positive side of a ramp function, is disclosed by Yoshida. Therefore it would be obvious to one of ordinary skill in the art to consider a range of 0 to 1 as a ramp function in order to properly weight the difference factor taught by Yoshida.

Allowable Subject Matter

6.   Claims 5-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 5, Yoshida teaches a means to adjust an output signal, however Yoshida cannot teach the exact architecture of the applicants claim such that it can be interpreted that Yoshida would teach a second means for processing the third signal to obtain a fourth signal, a third means for processing the first signal to obtain a fifth signal, and fourth means for combining the fourth signal and the fifth signal to obtain an output signal.

Claims 6-9 are allowed as they depend from claim 5.

Response to Arguments

7.   Applicant's arguments filed 12/17/2007 have been fully considered but they are

not persuasive.

Regarding applicant's argument that the Yoshida reference fails to to teach an

estimation of a spatial derivative the examiner respectfully disagrees. The applicant has

based it's arguments on Yoshida's background teaching that when using a single path

fading can easily be compensated, as is known in the matter disclosed in paragraphs

[0053-0054]. However the novel teaching of Yoshida is drawn to elimination of this

fading in multipath environments which is disclosed in the cited paragraphs [0056-0057]

in particular. Specifically Yoshida teaches that this evaluation can be preformed for

multiple antenna paths to calculate a corrective signal based on a "result of combining

these paths" where the sum of paths "is the variation values on the respective paths."

That is to say Yoshida teaches multiple path analysis.

For these foregoing reasons the claims remain rejected.

Conclusion

8.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

9.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Christian A. Hannon whose telephone number is (571)

272-7385. The examiner can normally be reached on Mon. - Fri. 8:00 AM - 4:30 PM.

        If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Ed Urban can be reached on (571) 272-7899. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

        Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. A. H./
Examiner, Art Unit 2618
February 28 2008

/Edward Urban/

Supervisory Patent Examiner, Art Unit 2618